CLAIMS

1. An optical storage medium comprising:

a plurality of tracks; and

a plurality of information pits arranged in the tracks and designed to produce reflection light upon irradiation of a light beam;

wherein the information pits are disposed in a matrix layout so that the reflection light includes at least four diffracted rays; and

wherein a selected pit of the information pits is offset from a first reference point in a track direction and a tracking direction, the selected pit carrying information indicated by a position of the selected pit relative to the first reference point.

2. The optical storage medium according to claim 1, wherein the information pits are disposed on a first line or second line slant with respect to the track direction and the tracking direction.

3. The optical storage medium according to claim 2, wherein the first line and the second line are perpendicular to each other.

4. The optical storage medium according to claim 1, wherein a plurality of offset positions are predetermined around the first reference point, the selected pit being placed at one of the offset positions.

5. The optical storage medium according to claim 1, wherein the tracks are divided into a plurality of sectors each including an address region and a data-recording region, the information pits being arranged in the address region.

6. The optical storage medium according to claim 5, wherein the data-recording region is formed with a land and a groove which are juxtaposed in the tracking direction, data being written to at least one of the land and the groove.

7. The optical storage medium according to claim 5, wherein each sector includes a reference data region provided with a plurality of reference pits used for tracking control and generation of a clock signal.

8. The optical storage medium according to claim 7, wherein the reference pits are arranged to produce reflection light including at least four diffracted rays upon irradiation of a light beam, each of the reference pits being placed at a second reference point.

9. The optical storage medium according to claim 8, wherein four reference pits are disposed around said each reference pit, the second reference point coinciding with a center of the four reference pits.

10. The optical storage medium according to claim 1, wherein the information pits are divided into a first group and a second group which are juxtaposed in the track direction, the information pits of the first group being staggered with the information pits of the second group in the tracking direction.

11. An optical information processing apparatus comprising:

an optical storage medium provided with a plurality of pits to produce reflection light upon irradiation of light;

a light source that irradiates the optical storage medium; and

an optical detector that detects the reflection light;

wherein the reflection light includes four interference regions separated in a track direction and a tracking direction, the optical detector being provided with four detection areas that detect light in the interference regions; and

wherein a relative position of each pit with respect to a reference point is discerned based on intensity of light detected by the detection areas.

12. The apparatus according to claim 11, further comprising a signal processor that discerns the relative position of said each pit, the signal processor being designed to reproduce digital information of said each pit based on the relative position of said pit.

13. The apparatus according to claim 11, wherein the optical detector is provided with a non-detection area surrounded by the four detection areas.

14. The apparatus according to claim 12, wherein the signal processor generates a radial push-pull signal and a tangential push-pull signal, the radial push-pull signal corresponding to a difference in light intensity of the interference regions in the tracking direction, the tangential push-pull signal corresponding to a difference in light intensity of the interference regions in the track direction, the signal processor discerning the relative position of each pit with respect to the reference point based on the radial push-pull signal and the tangential push-pull signal.

15. The apparatus according to claim 14, wherein the plurality of pits include a reference pit placed at a predetermined reference position, the signal processor generating a clock signal based on reflection light from the reference pit, the signal processor sampling the radial push-pull signal and the tangential push-pull signal in synchronism with the clock signal.

16. The apparatus according to claim 15, wherein the signal processor detects a tracking error based on a difference in intensity of light detected by the optical detector when the reference pit is irradiated by a light beam.

17. The apparatus according to claim 15, wherein the signal processor generates a tracking error signal by sampling the radial push-pull signal in synchronism with the clock signal.

18. The apparatus according to claim 12, wherein the signal processor performs coordinate conversion with respect to coordinates of each pit.

19. The apparatus according to claim 18, wherein the signal processor removes an off-tracking component from the radial push-pull signal before performing the coordinate conversion.